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ABSTRACT

A literature review investigated the still nebulous area of email's implications for literacy learning by reviewing the existing literature across disciplines on the interests and concerns of literacy researchers and educators about email and the major issues and areas of concerns which are and will be relevant for literacy researchers. The empirical papers and position papers examined dealt with email's impact on human behavior, cognition, and affects and its characteristics facilitating or hampering human interactions. Materials reviewed were published between the mid-1980s and late 1995. Results of the literature review indicated that (1) in reducing the social cues and enriching functions of easy editing, storing, and manipulating, email lends itself to more user control and user responsibility; (2) email is capable of bringing traditionally peripheral persons into the instructional mainstream; (3) due to its reduced sense of social presence, email communication exhibits some sense of anonymity and depersonalization; (4) email is direct, straight forward and more self-centered; (5) email offers users chances to develop positive attitudes but can also touch off some undesirable behaviors; and (6) anecdotal reports suggest that email might have effects on social behaviors such as collaboration and motivation. Further research should investigate cognitive implications of email-related literacy activities, social effects such as increased collaboration, affective anecdotes concerning motivation, and email's effects on different age groups and different language proficiency groups. (Contains 88 references.) (RS)

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What Do We Know About Email--
An Existing and Emerging Literacy Vehicle?

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1) Email and its definitions

In a society where it's almost impossible to avoid the words like "computer", "computer-mediated communications", and "email" in our daily life, we need to be aware that these terms, strictly speaking, should refer to different things.

Computer is doing far more than mere computations. As Nilles (1983) pointed out that computer processes all kinds of symbols: numbers, letter of the alphabet, musical notes, colors, and what not. Only due to historical reasons, the term computer still "sticks with us" (p.9). Among various functions today's computers are performing, communication is one of most prominent.

Computer-mediated communications have evolved into a complex of many things. Email, listserv, computer conferencing, ftp, gopher, Word Wide Webs, virtual reality, and combinations of some of them have made computer-mediated communications one of the most promising and fastest growing industries in the field of communications. Sometimes the term internet is loosely used to replace computer-mediated communication.

Email, a short and more frequently used term for electronic mail, is one way computer-mediated communications are being carried out. Yet, the definition for email has by no means reached an agreement.

Generally speaking, there are three definitions of email.

People in telecommunications and at systems supporting levels would adopt the broadest definition for email (Sirbu, 1981; Trudell, Bruman, & Oliver, 1984; Cross & Raizman, 1986; Vervest, 1986). Most of them would agree to define email as the following:

"[e]lectronic mail (EM) is an electronic communications system that is used to send information from one person/site to another (one-to-one communication), or from one person to many people at the same time" (Cross & Raizman, 1986, p.3). The broadness of the definition arises from the use of the term "electronic", which encompasses more than computers. To many people in telecommunications, email includes computer-mediated communications, telex, and fax. Though as Vervest (p.47) points out that computer-mediated communications play a central role in electronic communications, other vehicles of electronic mail such as fax are still within their scope of examination in regard to email communication. However, their broad definition is narrowed in another dimension when they stress the non-interactive nature of email and self-containing units of messages being sent (p.49). To many of them, these two are important features to define email: a) email should be non-interactive, and b) an email message should be a self-contained, stand-alone unit of information.

However, people dealing with internet or with information processing and management and more recent researches tend to define email only in the field of computer-mediated communication (Liu, Peek, Jones, Buus, & Nye, 1994; Romiszowski & de Haas, 1989; Manes, 1988; Robinson, 1992; Townsend, 1984; Pfaffenberger, 1993). To them, the definition of email does not go beyond the field of computers. Email refers to messages sent from one computer to another computer or computers through network connections. However, in their definition they broadly define the term "messages" by including graphics, tables as well as texts. Their emphasis is on the way an electronic mail is being conveyed. The definition does not distinguish between email and computer-conferencing or bulletin

board functions. As a matter of fact, some simply regard these being the extensions of "traditional methods of sending E-mail messages" (Robinson, 1992, p.130).

Many researchers in education, humanities and social sciences seem to have paid very little attention to defining email (Traw, 1994; Schwartz, 1990; Fey, 1994; Kinkead, 1987; Mabrito, 1991; Anderson & Lee, 1995) . The definition seems to be peripheral to their researches in regard to email. However, from their use of the term "email", it is not difficult to infer that most of them would define email more in terms of the textual possibilities than otherwise (Dreher, 1984; Thach, 1995; Hawisher & Moran, 1993; Wild & Winniford, 1993). Therefore, email in their description contains the messages sent via computers on a person-to-person basis, and also refers to such popular text-based features as listserv, computer conferencing, and newsgroups (Seguin & Seguin, 1995; Smith, 1994; D'Souza, 1991; Owen, 1990; Lowry, Koneman, Osman-Jouchoux, & Wilson, 1994; Sproull & Kiesler, 1986). D'Souza's (1992) definition of email would serve as a nice summary of what educators and social scientists think of email: "Email uses computer text-processing and communication tools to provide a high-speed information exchange service" (p.22). The text feature stands out prominently when educators and social scientists ever consider the definition of electronic mail.

The above definitions of email are roughly divided into three categories. The first appears to be broad in its technical aspects but narrow in the way the receiver and sender are to keep their respective roles. The second seems to have included only computer-mediated communications but considers sending and receiving any formats (such as graphics and tables) of information being within the definitional range of email. The third one narrows

down to the text-based information being sent via computers.

In considering the email's relevance to literacy acquisition, the present literature review would encompass only email studies defined in the third category. There are several reasons for doing so. First, while fax and telex machines perform some of the same functions as the computer communications, they have hardly ever been a popular communication tool to be used by teachers and students in any educational settings. In other words, they have very little relevance to the literacy acquisition emphases of this paper. Secondly, graphics and tables are not favored here because their utility in being a literacy vehicle is at most auxiliary, and also because some other forms of computer communication (such as WWW function) are geared towards such applications. Thirdly, due to the rapid development of computer communication hardware and software, it would be far too conservative to perceive email in the traditional way mail has been defined, namely, non-interactive and self-containing units of messages features. In other words, the characteristics of traditional mail should not be completely copied to define the electronic mail. For example, sending and receiving messages should not always have to be non-interactive when the technology allows otherwise. As a matter of fact, many researchers in education are investigating email and more interactive computer conferencing together in their studies due to the fact that these functions are closely associated. Last but not the least, literacy interactions occur both in one-to-one private correspondence and in group situations. Logically, it would be appropriate for this review to include interactive computer conferencing, listserv, bulletin board functions as part of email definition.

Therefore, the present endeavor would define electronic mail as being messages in

text form sent via computer networks from one person to another or to many others. It will include the normal mail function and conferencing, and newsgroup functions. This would allow us to have a full view of the characteristics of electronic mail without losing sight of the basic literacy acquisition focus we intend to keep here.

2) Who are interested in electronic mail

It would now be helpful for us to have a glance as to what has been emphasized up to now exploring electronic mail and its applications.

The advent of electronic mail has captured research interests in many fields such as business management, information processing, speech and communication, sociology, technology, composition, distance education (D'Souza, 1992; Hawisher & Moran, 1993; Rice, 1987; Smith, 1994). Researchers in the field of business and management and in communications are interested in looking at the application of this email vehicle and the beneficial effects such as cost-effective aspect and organizational effects (Grohowski, McGoff, Vogel, Martz, & Munamaker, 1990; Pearl, 1993; Sproull & Kiesler, 1986; Trevino, Daft, & Lengel, 1990) and are also focusing on the media appropriateness and selection given the organizational characteristics (Golden, Beauclair, & Sussman, 1992; Rice, 1993; Smolensky, Carmody & Halcomb, 1990; Steinfield, 1986; Sullivan, 1995). Researchers in communications and organizations are also interested in theory-building in email research (Daft, Lengel, & Trevino, 1987; Fulk, Steinfield, Schmitz, & Power, 1987; Kiesler, Siegel, & McGuire, 1984; Lee, 1994). Some researchers would delve into the issues of equity, gender, ethics, social status and democracy (Adkins & Brashers, 1995; Fey, 1994; Flores, 1990; Garton & Wellman, 1994; Olia & Martin, 1994; Sproull & Kiesler, 1986;

Sproull & Kiesler, 1991). Others display more interest in rhetoric and discourse conventions demanded by the particular media (Hawisher & Moran, 1993; Selfe, 1989; Angell & Heslop, 1994; Sherwood, 1994). Educational researchers and practitioners alike are intrigued by the prospects of distance cooperations in education through email and their instructional ramifications for traditional and nontraditional learners in the diverse society (Anderson & Lee, 1995; Coombs, 1993; Dreher, 1984; D'Souza, 1992; D'Souza, 1991; Kaye, 1992; Lowry, Koneman, Osman-Jouchoux, & Wilson, 1994; Owen, 1990; Paramskas, 1993; Spitzer, 1989; Traw, 1994; Wild & Winniford, 1993).

In the field of literacy education, some work has been done in the same direction (Anderson & Lee, 1995;). However in comparison to some pioneering work which has been done in regard to redefining literacy in the electronic era (e.g., Bolter, 1991; Reinking, 1994) and to exploring the ever-increasing educational resources available on the internet (e.g., Harris, 1994), literacy research in email and its impacts on literacy acquisition seems at most scanty and hardly begun.

3) The focus of the present paper

The present paper intends to investigate the still nebulous area of email's implications for literacy learning by reviewing the existing literature across disciplines in answering the following questions: I. How does the existing literature on electronic mail across disciplines shed light on the interests and concerns the literacy researchers and educators have about email? II. What are some of the major issues and areas of concerns which are and will be relevant for the literacy researchers?

While this literature review tends to focus on the literacy implications of email

research, it is necessary to reach beyond the field of literacy and education to gather sufficient studies to make this review a meaningful endeavor. However, due to the proliferation of email research in other fields (see Garton & Wellman, 1995), a review of empirical studies and speculative papers would be almost tantamount to a Sisyphean task (Garton & Wellman, 1995; Holmes, 1995). Therefore the author has exercised the following discretion in selecting the papers and studies to be reviewed.

First of all, concentration has been on the papers dealing with email in terms of its impacts on human behaviors, cognition, and affects and its characteristics facilitating or hampering human interactions. The author believes these factors are important to the nurturing or development of literacy. In this sense, papers of a pure technological nature are excluded. Secondly, because researches in email have been relatively recent and because some email characteristics (such as the semi-private nature of email) pose difficulties for conducting experimental studies, the author decides to include both the empirical papers and opinion papers in this review. However, the author does want to make efforts, in the process of reviewing the literature, to disentangle the empirical evidence from speculative conjectures. Thirdly, ERIC documents are not included. Papers from peer-refereed journals and publications are expected to better catch the essence of research concerning email. It would also alleviate to some extent the amount of literature to be reviewed. Fourthly, the author has made particular efforts to look into literature in relevant fields. Literatures from education, communication, social sciences, business and information management are included with the intention of better understanding the scope and depth of the impacts and displayed characteristics of email.

With these criteria in mind, the author located most of the papers through ERIC, ECONOLIT, SOCIOFILE, and Linguistics & Language Behavior Abstracts online databases. The rest of the papers were located through referring to the references cited by the previously located papers and a hand search through the latest issues of major journals in computers, communications, education, and literacy acquisition.

The search results produced a natural time limit for the papers to be reviewed: from mid-eighties to sometime late in 1995.

Review and Findings

The email literature reviewed will be summarized and discussed in three parts: characteristics of email; some instructionally relevant aspects of email communication; and a brief overview of the methods used and some methodological concerns.

1) Characteristics of email

Characteristics of email have set it apart from other more traditional forms of communication such as postal mail, telephone, and even face-to-face communication. It is speedy, less formal, asynchronous/synchronous, and text-based, allows both dyadic and multiple connections, and lends easily to storage and manipulations (Garton & Wellman, 1995; Sproull & Kiesler, 1986; Steinfield, 1986). However, these characteristics have rendered the email more than a different tool from the traditional means of communications (Bikson & Eveland, 1990). It has been and is still being shaped by its users and tasks it has been put to. On the other hand, users and tasks have also been shaped by email.

A. Distance vs. proximity and the blurring of these two concepts in email

Mail of different purposes was sent between separated parties even in the ancient

Greece when mail correspondence was at its enfant stages (Stirewalt, 1993). Email, to some extent, is performing the same task at a much faster speed as postal mail of transcending the physical distance. One study (Steinfield, 1986) finds that people more likely use email to communicate with people outside their own work group than with coworkers in proximity. This is also the case in Schaefermeyer and Sewell's study (1988). Their survey sent to subscribers of 3 listservs finds that 66% of the respondents used email to communicate with people of similar interest in different locations. Another study done in the field of organization and management concludes that people receive more information via email by people who are physically separated from them (Feldman, 1987). Feldman finds that out of the sampling pool of 1249 messages, 500 messages are new communication between strangers and 80% of these would not have been sent without email (p.93).

In education, Coombs (1993) describes a project utilizing email to teach two courses to physically impaired students on two campus five hundred miles apart. Robinson (1994) cites Morgan and Sheets' report of teaching physics and higher level math via email across eleven time zones. Schwartz (1990) provides an instance when students from three high schools, located respectively in Montana, South Dakota, and Pennsylvania, were able to talk and discuss via email. A sense of proximity has been created through email connection. Dreher (1984) terms this proximity as being a distance "but a few keystrokes away" (37).

In addition to the shrinkage of spatial distance, email communication also transcends the time distance. Many researchers have noticed the asynchronological/synchronological nature of email (Garton & Wellman, 1995; Rice, Grant, Schmitz, Torobin, 1990; Spitzer, 1989). Though no specific studies on the effects of asynchronology/synchronology of email

has been done, many researchers have stated this as a sure characteristic of email communication. This email feature is mostly being viewed as advantageous (Kaye, 1992; Spitzer, 1989). It does not necessarily require the sender and receiver of the message to be present at the same time. When conferencing function is adopted it could allow sender and receiver to be in real time interactions. Therefore the time distance between the sender and receiver is not posing a threat to the integrity of the message.

With the distance over space and time blurred, email communication has been found to be creating involvement on the part of the users, especially for those who are peripheral to the group (Eveland & Bikson, 1988; Huff, Sproull, & Kiesler, 1989; Kaye, 1992; Selfe, 1990; Spitzer, 1989). Academic conversations, which are usually carried out in traditional classroom settings and are unavailable to writers and readers due to age or economic constraints, are made accessible to them (see Selfe, 1990). Individuals who are reluctant to participate in a traditional classroom atmosphere find email communication a venue for their intellectual participation (Hiltz, 1986). Email communication has been found to encourage organizational participation and commitment (Huff, Sproull, & Kiesler, 1989). The retired participants in Eveland and Bikson (1988) show more involvement with other members via email communication.

However, some other researchers find email communication, while creating a proximity overcoming spatial and temporal distance, actually poses another distance between the users (Daft & Lengel, 1986; Kiesler, Siegel, & McGuire, 1984; Siegel, Dubrovsky, Kiesler, & McGuire, 1986; Sproull & Kiesler, 1986; Trevino, Lengel, & Daft, 1990). For researchers interested in the relationship between media and organization, email

communication has been found to be lean as a media (Daft & Lengel, 1986). This leanness of the media is due to the reduction of verbal expression cues and nonverbal subtleties and lack of a sense of personal presence and identity which are usually available in face-to-face communication and phone communication (Trevino, Daft, & Lengel, 1990). This lack of personal contacts and verbal prompts produces a sense of anonymity and depersonalization and has been found to be contributing to the increased use of uninhibited speech via email communication (Kiesler, Siegel, & McGuire, 1984).

This mixture of distance and proximity has witnessed a vast incongruence in research results in regard to the preference of communication means. The preferences for using email range from the least (Rice, 1993) to the neutral (Trevino, Daft, & Lengel, 1990; Yates & Orlikowski, 1992) and to be one among the most (Hiltz, 1986; Lee, 1994; Sullivan, 1995). One explanation for the drastic difference in using and preferring email would be the media choice according to message nature and competence of the agents (Daft, Lengel, & Trevino, 1987). Daft et al. found that lean media such as email would be preferred when the message sent is less ambiguous, while rich media such as face-to-face communication is needed when the message sent is more equivocal in nature. The high-performing managers are found to be more sensitive to the coordination between media richness and message nature. Sproull and Kiesler (1986) have reported that people prefer to use email to send sad salary news (p.1508). Another explanation for the difference is offered by Mackay (1988). Users' different use of email communication has been found to be connected with individual's evaluation and perception of email. According to Schmitz and Fulk's study (1991), social influences of colleagues have significant effects on people's media assessment. Lee (1994)

substantiates this by confirming that richness (or to be preferred) is not an inherent property of email, and rather it is a result of the interaction between the medium and environment.

B. Flexibility vs. Conventions

While flexibility certainly points, in part, to spatial and temporal flexibility email allows over conventional confines of communication means (as we have discussed above), we are here concentrating more on researchers' efforts in identifying and evaluating the email messages in terms of the social and discourse conventions.

Researchers have articulated certain features which make the email form of writing different from conventional writing. There are two aspects to this: convention and flexibility. Unlike conventional mail forms such as personal letters or business letters, email messages read more like memos or notes and have now obtained their own discourse forms or their own conventions (Wilkins, 1991). Many researchers have noticed such breaking down or blurring of the conventional forms (Hawisher & Moran, 1993; Selfe, 1989; Siegel, Dubrovsky, Kiesler, & McGuire, 1986; Sproull & Kiesler, 1986; Yates & Orlikowski, 1992). Sproull & Kiesler (1986) find that people focus more on themselves than on others in message salutations and closing. Rhetorically speaking, email messages become more straight forward (Holmes, 1995). They convey the intended information in less subtle form (see Goode & Johnson, 1991; Paramskas, 1993). Yates and Orlikowski (1992) suggest that email messages could be studied from a genre perspective to take into consideration both the conventions and variations. Some unique written styles and symbols are now universally accepted to make up for its less subtle messages. Among the commonly used styles and symbols are capitalized words (for shouting), :-) for a smily, ;-) for humor, and :-(for a sad

face. In organizations, theoretically this would benefit the flow of information given the availability of email systems to their members and consequently improve the performance of the members (Grohowski et al, 1990). Yet, due to the absence of social cues such as gestures, facial expressions, dresses, tones, there is little evidence that managers in general would prefer the email communication (Adkins & Brashers, 1995; Trevino et al, 1990), though such communications are found to be permeating organizations (Sproull & Kiesler, 1986).

One of the most prominent features of email communication lies in its ease of editing, storing, duplicating, and delivering or distributing (Sproull & Kiesler, 1986). This feature, when combined with its suppressing of social cues, lends itself to the flexibility both in the content scope in which email functions and in the direction information flows.

The content of the email ranges widely from seeking information (sending a request) to establishing relationship (e.g. partnership) (Kinkead, 1987; McCormick & McCormick, 1992). McCormick and McCormick (1992) have analyzed undergraduates' 645 pieces of email messages and found that students' messages via email are of a wide range, running from news-sharing to the exchange of crude flirtatious comments and put-downs. Their analysis reveals that students' writing certain type of messages is correlated with a particular time period during the semester and among certain groups. For example, undergraduates seem more likely engaged in sending computer programs to each other when the end of the semester is approaching. Put-down messages are found more frequently among the acquainted than the unacquainted. Email allows the users to be engaged in a more conversational style (see Kinkead, 1987; Kueln, 1994) or writing more lengthy intimate or

romantic messages (McCormick & McCormick, 1992). Kinkead's description (1987) shows that instructors are usually engaged in the same wide range of email usage as students. Upon being introduced to email, instructors are utilizing email to share knowledge of computer operation, peer editing, grading and even coordinating some evening events. This flexibility has certainly integrated many features of telephone, face-to-face and regular mail in social interactions.

In email communication, the flow of the messages is not uni-directional but could be bi-directional. Hiltz (1986) has observed the enabling factor of computer conferencing by allowing each individual a chance of responding to a question. This would not be possible in traditional classroom discussions when a question is usually answered by only a few students. Romiszowski and de Haas (1989) describe their experience in conducting computer conferencing among students and only to find that the topic they have designed is overshadowed by other topics unexpectedly initiated by students themselves. One of the benefits of email communication highlighted by McComb (1992) is the possibility for students to function and access instructor independently and at the same time retaining their class or group participatory functions.

The email communication not merely allows the conventional hierarchical structure of communication, but opens some horizontally-flowing communication possibilities (Fey, 1994). The horizontal communications among students make students open themselves up to their classmates which would be impossible without this particular communication tool. The flow of information enabled by the email communication among one's peers and colleagues has some very positive implications. The frequent inquiries cited by Pierce, Grass, Young, &

Soucy (1994) as appearing in listservs are good examples for the positive results of such horizontal information flow.

Researchers have noticed that the flexible features of email have played roles in shaping the new structures of relations of the email users and changing the distribution of information (Sproull & Kiesler, 1986). Users concentrate more upon themselves than on other people. In other words, the users become more self-centered or more aware of themselves. One possible explanation is that the prominent social cues are invisible in email communication (Sproull & Kiesler, 1986). Another explanation comes from Nilan's (1993) speculation that network brings about multiple voices of a wide range in a new type of conversation. The centrally controlled voice as dominating the printing cultures is disappearing (Bolter, 1991).

C. Control vs. non-control

Researchers in communication and education alike have noticed the control versus non-control feature of email communication (Fey, 1994). Both positive and negative phenomena rising from this have been looked into and speculated.

Nilan (1993) elaborates on McLuhan's perspective and communication by pointing out that networking age has brought an end to the univoice of print which is linear in nature. With information disseminated at uncontrolled directions/dimensions, the networking promotes multi-voice and multi-center. However, according to his speculation, users of networked computers will find their own focus by grouping around a topic of similar interest. Therefore, the opposite to control here is not non-control or anarchy but choice by the users.

Many researchers view this lack of control to be an excellent feature of computer

communication. Fey (1994) described the emerging of the traditionally silent voices of students in her writing class. The reflective time and thin presence of social cues offered by email have made these traditionally reticent students speak out through email communication. The students are not intimidated by the atmosphere in a classroom which usually stops them from speaking out. The newly found voices found their way into their final essays. McComb (1994) believes that computer communication provides a balance of power when teacher is no longer the sole controller of the classroom. This lends the students with the authority of controlling some part of the learning activities. Together with the authority, students have got responsibility (p.165). This control on the part of the users might result in more positive attitudes, more system use and more positive work outcomes (Webster, Trevino, & Ryan, 1993).

Some researchers have observed various negative impacts of this control-lacking feature of email communication (Goode & Johnson, 1991; Hawisher & Moran, 1993; Olia & Martin, 1994).

From a sender's perspective, a response to one's message sent is not within one's control. In the email communication, some messages might be lying in the receiver's email box for a long time before being read and by then the information contained in the mail might be outdated. One interviewee in Mackay's study (1989) has embodied this fear. She would only budget half an hour to read email a day and believes that anything really important she has missed in the rest of the email pile would be communicated to her via phone. Also from the perspective of the sender, once a message is sent, there is no way to guarantee privacy or integrity of the message in the strict sense. Someone somewhere might

read it whether it is intended or not (McCormick & McCormick, 1992). The message might also be easily garbled and forwarded (Goode & Johnson, 1991; Olia & Martin, 1994). In other words, once a message is sent, the sender loses the ownership to a great extent (Lee, 1994).

From a reader's perspective, lack of control in coordinating the email messages would result in confusion. Hawisher & Moran (1993) have remarked from their own experience that readers of email messages usually have difficulty sorting out the salient from the less salient elements of messages (p.630). Even the bulk of the email messages creates some confusion on the part of the reader (Romiszowski & de Haas, 1989). Structures of the discussions are usually not clear (p.9). They found, through a post hoc analysis of the email messages sent, that discussions had not been carried far deep into other topics as they originally believed. However more often than not, retrospective examination of messages by students is not possible (Hawisher & Moran, 1993).

The lack of control also goes into the content of a message. The biggest concern many researchers and users all share about email communication is the flaming problem (Goode & Johnson, 1991). McCormick and McCormick (1992) report finding undergraduates using email to send messages of threats and put-downs. However they find to some extent that these flaming messages have been sent by male undergraduates who know each other well. Their explanation for this is that it resembles the mock physical battles between male adolescent friends (p.390). Siegel et al. (1986) report more frequent occurrences of uninhibited behavior among students using email communication than when students in face-to-face discussions. 34 instances of swearing, insults, and name-calling are detected among

email using students, while none of such inhibited interpersonal behavior is found in face-to-face discussions (p.174). They deem it to be the result of depersonalization of situations (p.175). Smolensky et al. (1990) find some interactions between task type, group structures, personalities, and uninhibited speech. Group members who are preacquainted and assigned to a definitive solution task have the most flaming. They also find members who are extraverted flame most. Their study detects an inverse relationship between uninhibited speech and group productivity. Goode and Johnson (1991) intend to set up some guidelines for users of email to follow. They advice users to be sensitive to the style and audience intended. If need be, they argue, a retaliation or an emotional response should be started with the words "flame on" or "flame!" and like warnings to forewarn readers (p.62). Berge (1994) suggests using a moderator in group discussion (such as in LISTSERV and Usenet settings) to "filter" (p. 105) the flaming in the discussions.

2) Instructionally-related advantages/disadvantages of email communication

Some of the cognitive impacts on individuals and communities are being speculated and conjectured (McComb, 1994; Nilan, 1993). The basic assumption is that of McLuhan's concept of the relationship between the communication means and human cognitive patterns. However, there are no empirical studies to date to substantiate these cognitive assumptions. On the other hand, researchers do come up with abundant proofs for the email communication's social (such as collaboration) and affective (such as motivation) effects on the users.

A. Cognitive impacts speculated

McComb (1994) has argued that critical learning occurs when students are engaged in

critical reflection on their personal, political, and social lives. Email communication seems to promote a "pedagogy that encourages students to be active creators of, rather than passive reactors to, society" (p.157). In other words, learning activities, from this perspective, come from students' concerns and interests, and occur in reflection and interactions. Both Romiszowski et al. (1989) and Anderson et al. (1995) suggest that the reflective thinking does happen with their students in email interactions. Nilan (1993) proposes that thinking habits and patterns change with the expanding networking. Feldman's description (1987) of members' negotiation of interpretations of a piece of information within the organization seems to have confirmed this. Members within the organization are sharing their interpretations with other people. Though a universally shared belief is not expected from this sharing, a better understanding about the organization by its members might be the result (p. 97). Many researchers find that it takes the email group longer time to reach consensus (Hiltz et al., 1986; Kiesler et al., 1984). They give many conjectures as to why this is the case. It might be due to the fuller exploration of some minority opinions which could not receive the same probing otherwise (Siegel et al., 1986). It might also be due to the less structured manner of email proposals (Garton & Wellman, 1995, pp. 442-443). Another possible reason for a longer time for decision-making might lie in email communication's capacity of letting the users or senders think before responding (see Fey, 1994, p.226; Spitze, 1989, p.197). In other words, consensus reached over a longer period of time may signify that the pattern of decision-making is being changed by email communication: individuals are willing to spend more time in stating their views and considering other's points. That might result in high-quality decision made by email users (Garton & Wellman,

1995, p. 443; Rice, 1987, p.80).

Besides, Selfe's (1990) suggestion of a different notion of text in computer writing and Yates and Orlikowski' (1992) genre perspective interacting with and shaped by the email medium have also more than hinted at the possibility of cognitive impacts. Selfe (1990) argues that the fluid and dynamic nature of the writing on the screen alters the way a reader sees and interprets texts and their relationship with the reader (p.128). Yates and Orlikowski (1992) suggests that email messages should be viewed as an extension of some existing genre and possible emergence of some other genres which puts the media adoption in a historical perspective, and which should reflect and impact our perception of the human/media interactions within specific social contexts.

However, all this is still to be substantiated with solid researches which are still few in the field of literacy and email. D'Souza's study (1991) finds that a group of sophomores taking a business information system course via email outperformed those who take the traditional format of the course in the overall exam and the posttest. However the mechanism behind this is not pursued and left unexplained. Adrianson and Hjelmquist (1993) report their study done in Sweden which find that more experienced email communication users seem to be able to retain more text ideas via email communication while the inexperienced users retain the text more via a face-to-face communication. Due to the design of the study, the emphasis is not on the original communicating of the ideas via different means but the recall of the ideas through different means of computer communication and face to face communications. Therefore this study can only speak at most about the proficiency level of the users of different means but not the cognitive impacts per se.

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However clearly conflicting results do exist. Smith (1994) in another study finds no significant gain for the email users in their final exams in a journalism course.

Some negative impact possibilities of email have also been noticed by researchers (Hawisher & Moran, 1993; Lowry et al, 1994; Pierce et al, 1994). They all find that email discussions can lack consistency, become disjoint, and be sometimes hard to follow. This perception about the disorderly aspect of email communication, however, has not been empirically examined and substantiated to date.

Email's impacts on the cognitive aspects of literacy acquisition and instruction remain unclear. Yet, chances of increasing reflective thinking (Anderson et al., 1995; Romiszowski et al., 1989), bettering understanding of one's social environments (Feldman, 1987), and studying appropriate text models of genres (Yates et al., 1992) have the promises for new implications for literacy instruction and acquisition through email communication.

B. Collaboration: social effect

Collaboration appears to be the most commented outcome of email researches (Fey, 1994; Mabrito, 1991; Schwartz, 1990; Selfe, 1990; Spitze, 1989; Traw, 1994; Wild & Winniford, 1993). Many studies agree that email communication seems to lend itself well to collaborations of various kinds. Collaborations of any kind involve interactions with other people within society. Since social interactions have been believed to affect literacy acquisition (Vygotsky, 1978), the possibility of collaboration offered by email communication provides a viable means for understanding email's potentials in promoting literacy acquisition.

Schwartz (1990) has reported an observational study about the collaboration going on

among three high schools across vastly different regions. Email has been used mainly as a tool to facilitate communications among students who would otherwise never know each other. Descriptive observations have been produced to bear proof to students' improvement in understanding each other through email communication. This type of collaboration among students in sharing their perceptions and enhancing understanding of others provides the true context for meaningful writing. They are not collaborating on the level of helping each other write, but on the level where they assist each other to understand other cultures.

This kind of distance collaboration is reported used for decision-making tasks (Wild & Winniford, 1993) carried out in two similar introductory courses offered at two different universities: one in Hawaii and the other in Texas. Students at these two vastly distant and different locations seem to have made their unique contributions to the decision-making tasks (p. 196). Many students felt that their writing skills have been improved through this kind of remote collaboration via email (p.199). One teacher has observed that overall efforts of students and individual reports seem to be of a higher quality than those of the previous semesters (p. 198).

Collaboration between university students and school students is reported by Traw (1994). University students in a literacy class have collaborated with elementary school students in developing a theme unit teaching plan. Email has been the channel through which they communicate with each other. The collaboration is found to be fruitful for both groups of students. For university students, the benefits are two-fold. The university students, by incorporating the input from their elementary school collaborators, are able to produce better teaching plan for their unit. Besides, they have also got a first-hand experience of elementary

students' development state and their reading tastes. For elementary students, they have been introduced to new books of good quality, and they have got a boost of self-confidence and self-esteem (p. 30).

Fey (1994) describes the collaboration of a batch of non-traditional students in her college writing class. Their collaboration occurs at two levels. On the one level, they share experiences with each other through email communication. Their dialogues thus carried on via email help them to develop ideas and themes for writing (or finding their voices in) their essays. On another level, they critique each other's writing ideas and themes to make their thoughts straight or clarifying their found voices. Adopting a feminist view point, Fey (1994) observes that the usually silent voices of women and the academically underrepresented are gradually speaking out frankly and loudly through collaborative atmosphere made possible by email. These voices find their way into each other's final essay production (p. 235) and contributes to their literacy development (p. 237). Anderson and Lee's (1995) study has specifically required the collaboration among master level students in critiquing each other's drafts of their seminar presentations. They are encouraged to use email communication to accomplish this. The study finds students exhibit collaborative spirits by sharing and requesting for help and building a sense of community. They believe that students are also engaged in more reflection (pp. 231-232) and literacy risk-taking (pp. 232-233).

A study done by Mabrito (1991) on high and low apprehensive college writers' participation in group discussions via email communication has shown that traditionally reticent writers in normal classroom situations tend to contribute significantly more ideas in collaboration via email. Email communication is perceived to be able to elicit the

contribution of those traditionally silent voices by providing the high apprehensive writers "a productive and non-threatening forum for sharing their writing with other students and responding to other students' text" (p.529).

From a feminist point of view, Selfe (1990) has suggested that participation and collaboration in general via email communication is not the essence of our new vision of this communication. Instead "we would also want to ensure that increased participation on computer networks or within a computer-supported classroom can, in turn, encourage new, different, even revolutionary patterns of information exchange and conversations--those that allow individuals with traditionally marginal relationships to an academic discourse community to bring themselves to the center of that community's exchanges" (pp.124-125).

Spitze (1989) provides some anecdotal account of another kind of collaboration via email: that between the faculty members and students in helping students' essay writing (p.195). Collaboration via email among faculty members and researchers are also mentioned by some researchers (see Selfe, 1990, p. 124).

In sum, there are various kinds of collaborations via email which have been recorded to date.

In the field of communication, a researcher (Peters, 1994) confidently asserts: "poor communication fosters domination; good communication fosters competition; and excellent communication promotes collaboration" (p. 24). Generally speaking, educators and educational researchers would agree with this as a general principle in instructional settings. As a matter of fact, the reported studies or collaborations through email have illustrated the possibility in aiming at this "excellency" in education and literacy education. In some sense,

literacy is an act of communication. The collaboration opportunities are reported to have occurred among teacher education students(Traw, 1994), content area college students (Wild & Winniford, 1993), high school students (Schwartz, 1990), traditionally marginal students (Fey, 1994; Mabrito, 1991), and educational researchers (Selfe, 1990). However, before we can extol collaborations made possible by email, it would be imperative to study the collaboration phenomena in email through more rigorous studies. We need to know whether email communication truly promotes collaborations (not an artifact), and to what extent. Further, We need to look into the dynamics of social interactions created by email collaborations for better understanding literacy activities occurring in email context.

C. Motivation: affective effects

Literature concerning email is ripe with statements of motivational effects of email (e.g. Hiltz, 1986; Spitze, 1989; Traw, 1994) . However, no substantial studies have been done in regard to the motivational aspects of email communication.

Motivation is a multi-dimensional term. At its simplest level, motivation could be divided into extrinsic and intrinsic. However, since no empirical studies have been done regarding the motivation in email, it would be hard to impose the dichotomy upon the statements authors have made in their papers. The alternative here is to use some terms used by some researchers as subheadings under the superordinate term "motivation".

I. Equalization

Many researchers believe that email communication has had equalizing effect upon the social, economic, and intellectual status of email users (see Garton & Wellman, 1995, p. 441; Hawisher & Moran, 1993, p.634; McComb, 1994, p.160; Selfe, 1990, p. 127). Garton

and Wellman (1995) have summarized email researches in communication and organization. They suggest that email tend to encourage low social status users to speak out, encourage equal participation of all members, and suppress the difference even between experts and novices (pp.440-441). These findings are generally what have been stated by educational researchers as well. For instance, Selfe (1990) states her belief that email communication promotes "more egalitarian discussion" and provides " marginal community members a medium through which their contributions might become increasingly central" in instructional settings (p.127). McComb (1994) has explicitly remarked the altered relationship between teachers and students: "the power relationships between students and teachers are more equalized" (p. 160).

This "equalization phenomenon" (Hawisher and Moran, 1993) could be motivating for those who are traditionally marginalized. However social equalization could also be altered when the initial phase is passed (Romiszowski & de Haas, 1989). In the group discussion situations, they point out the equalization balance tends to tilt when readers begin to get familiar with messages of participants: "the status of the participants in the conference" is no longer the same (p. 9).

One study (Ahern, Peck, & Laycock, 1992) has explored this equalization factor on classroom interactions among class members by manipulating the discourse forms of the teacher's through computer communication. The conversational style of the teacher has been found to be increasing the dynamic patterns of classroom interactions and encouraging students' selection of the topics for discussion, while question and statement styles the teacher uses seem to have imposed constraints on the classroom interaction. This study shows

the equalizing effect through computer on all members in instructional situations.

In sum, email seems to have the promise of involving the marginal members of traditional educational institutes and facilitating students' participation as a whole. As some literacy researchers (see Heath, 1991) point out, literacy is embedded in social and cultural contexts. In other words, as an involvement (Brandt, 1990), literacy always occurs in social and cultural interactions. Therefore in examining the literacy participation of traditionally marginal members, researchers' would benefit by paying attention to the motivational factor of involvement through email in various social and cultural situations and when members of traditionally different status are involved. Interaction patterns of the differently-formed communities would shed light on our understanding of literacy activities. On a practical dimension, this understanding will also help classroom teachers find better ways to motivate students to be involved in meaningful literacy acts without losing sight of different literacy challenge to individual students.

II. Socialization

As we have already discussed in the previous section concerning distance and proximity, this feature of socialization seems to be responsible for a large chunk of email messages sent by users. People use email to get beyond one's own physical circle and establish new relationships (McCormick & McCormick, 1992). Socialization seems to have prompted sending of these email messages. However as some researchers (Smolensky et al., 1990) has observed that there are differences between extraverts and non-extraverts (possibly introverts) in sending out emotional messages, the differences might also extend to the willingness in socialization via email. In other words, we need to know whether email would

motivate certain people to socialize and not some others. In instructional settings, this motivational factor due to socialization through email communication deserves special attention. Learning, especially literacy acquisition, is perceived as being accomplished through social interactions. Then the question follows would be: What do we know has been accomplished in the email socialization in terms of learning and literacy acquisition?

III. Information gathering

Many researchers have mentioned the sharing of news and ideas (Feldman, 1987) among email users. Whether the purpose or consequence of sharing is to entertain or inform, users seem to be doing this information dissemination via email anyhow (e.g. Coombs, 1993, p.24). Some speculations are being made as to the information sharing and gathering (D'Souza, 1992; Robinson, 1994). Both D'Souza and Robinson suggest that users in the instructional settings will have wider access to informational resources. Yet, studies need to be carried out to decide whether there are any significant differences between information gathering or sharing when they are using email as opposed to them when using regular channels of communication. The motivational mechanism here concerns using email for this end is not clear at all. The relevance to literacy acquisition of voluntary sharing and gathering information might be indisputable. However, one crucial question follows this is to examine what types of information motivate students to share and disseminate. This knowledge can help teachers capitalize on the motivational factor of this email feature to facilitate students' literacy growth.

IV. Satisfaction

User gratification of the utilization of communication means has always been a topic

in mass communication since late 1940's (see Kueln, 1994, p.178). However, the results are mixed at most in email research (e.g., Kinkead, 1987; Smith, 1994). Kinkead (1987) has cited students' evaluation of the email conferencing to show the overwhelming gratification on the part of the students (p.339). Students in Smith's (1994) study seem less satisfied with email communication (p.31). Some students are cited saying that they hope not "to be subjected to it again" (p.31). The mixed results might come from users' experience levels with the email software and the degree of technical support available (Anderson & Lee, 1995, pp. 234-235). Komsky (1991) found the frequent users of email have less complaints about system problems. They suggest that frequent users might be more aware of the problems and so more tolerant of them (p.331). With the improvement of email software and technical support, we might expect to see less complaints and more satisfaction. It is natural that the more satisfied students are with certain channel of communication, the more they will make use of it. While email holds this promise of satisfying students in communicating with others, literacy educators can take advantage of this email feature to motivate students by either exposing them more frequently to email communication or resorting to the best affordable email managing systems.

V. Gender and age

Few studies on email have touched upon this. One study (Parry & Wharton, 1995) does look into these two factors together with staff and faculty users' professions in using the computer networks including email. They find that gender is not a factor in deciding the use or not. While young people have been found to tend to have more use than older people, the factoring in of the profession makes age factor not significant. McCormick and McCormick

(1992) have found no difference between genders in using email communication among college students. In another study of the networking effects on 5th graders' writing, Allen and Thompson (1995) find no difference of network communication between genders. Though some feminist claims of email empowering females' traditionally silent voices have been made (e.g., Fey, 1994), no qualitative data to date have been sufficiently collected to shed light on email's use and effects on gender. Age factor remains virtually unexplored in email communications in educational settings. Since both gender and age have been important in educational research and instructional settings, it would be helpful to have more studies explicitly exploring email's relationship with gender and age in education.

3) A brief description of methods used in studies reviewed

The papers reviewed here can fall roughly into the following two categories: conceptual/opinion-expressing and qualitative/quantitative.

I. Conceptual/Opinion-expressing papers

Conceptual papers usually attempt to build some theoretical basis for email research in light of the email features. Most of these efforts, however, have been made by researchers in the fields of communication and management sciences. For example, the social presence perspective suggested (Kiesler et al, 1984; Siegel et al, 1986; Sproull & Kiesler, 1986) aimed at revealing the email communication's impacts on organization. Daft and the colleagues (Daft, Lengel, & Trevino, 1987; Trevino et al, 1990) have proposed their symbolic interactionist perspective as a basis for understanding media selection. They focus on the creation and sharing of symbols and meanings through social interactions. Another group of researchers (Fulk et al, 1987; Steinfield, 1986) put forth a theory of social information

processing as predicting user preference and motivation for using email. Lee (1994) has illustrated using hermeneutic interpretation to explore email as a media. Yet, validation and application of these theoretical orientations into email research in educational field and literacy education, in particular, are still to be done.

There are some educational researchers who have made some efforts to theoretically visualize email application in instructional settings. For example, several educational researchers (Fey, 1994; Selfe, 1990) have advocated a feminist perspective in examining email's influence in education. Some others (Hawisher & Moran, 1993) have adopted a more text-driven perspective in calling for a new rhetoric in teaching writing using email.

However, aside from the theoretically oriented papers, many papers in education, in particular, are opinion papers. They generally fall into two categories: belief papers, and prescription papers. The belief papers usually express their belief that email works well in educational settings by describing their own or other's experiences with email use. For instance, Traw (1994) has viewed email as a unique approach in teaching reading and language arts courses by describing his experience with students using email for collaboration. Spitzer (1989) also uses his email interactions with students in his poetry class and some experience of others' to support his claim that it broadens the future of education. Similar practices could be find in quite a few papers we have examined (e.g., Coombs, 1993; Dreher, 1984). The prescription papers tend to emphasize ways of implementing email research and application in educational settings. For example, D'Souza (1992) tries to describe how email could be used both in classroom settings and in research environments. Lowry et al, (1994) have briefly stated their own experience with email, provided tips for

using email in class discussions, and listed some research questions for future research. From a political viewpoint, McComb (1994) has emphasized another pedagogy "in which students and teachers communicate outside the classroom, in which students share control over the course" through email communication.

Three points to be highlighted here concerning conceptual papers. First, most the theoretical works in regard to email are done in the fields outside education. Second, educational researchers' efforts in establishing theoretical basis for email communication are mostly politically oriented. This makes the theory-building or application one-sided. Third, most of the conceptual papers in education are opinion papers. These could be praiseworthy in making the first steps in email research. However speculations seem still to be supported by more solid data and theory.

II. Qualitative/Quantitative Studies

Qualitative/quantitative studies concerning email vary greatly in their designs and rigorness of analysis. Message recording, questionnaires, interviews, and computer record tracking are the commonly employed methods for collecting data. In a more lab or experimental situation, some researchers have also collected data based on students' performances in certain achievement and personality tests. Many a time, researchers would combine qualitative method with quantitative method in their studies.

Content analysis has been extensively used. Examined closely, content analysis has been executed in several different ways according to units of analysis. Some studies (Ahern, Peck, & Laycock, 1992; Feldman, 1987; McCormick & McCormick, 1992; Schwartz, 1990) have used each individual message as the unit of analysis. Some (Anderson et al, 1995;

Zimmerman, 1987) has used theme to be the unit of analysis. Others (Mabrito, 1991; Walther & Burgoon, 1992) have used idea units as the unit of analysis. Still others would use linguistic features (Hiltz, Johnson, & Turoff, 1987; Wilkins, 1991) and word counts (Zimmerman, 1987) as the unit of analysis. However some studies have combined the above different units of analysis in their studies (Zimmerman, 1987).

Questionnaires are seldom done alone. For example, Hiltz (1986) used a survey questionnaire together with the computer record-tracking capacity to describe a virtual classroom. Content analysis have been used together with questionnaires as well (Allen & Thompson, 1995; Questionnaires are also used together with students' achievement scores (Smith, 1994) or with some classroom projects (Wild & Winniford, 1993). However, survey questionnaires are sometimes used as the exclusive source of collecting data when online data are either not available to the researchers (Golden et al, 1992) or when researchers are only concerned with users' perceptions of email usage (Huff, Sproull, & Kiesler, 1989; Komsky, 1991; Schaefermeyer & Sewell, 1988).

Interviews usually serve as an additional source for triangulating with other data sources. For example, Mabrito (1991) uses interviews as a follow-up for the content analysis to probe students' perception of the revisions in their writing assignments. Wilkins (1991) has used informal interviews with some participants in his study to get an insider's view about what his content analysis reveals of the email conversations.

Many studies done using either content analysis or questionnaires outside the field of education have also employed quantitative methods to probe into the data. Methods ranging from simple percentage counts (Mabrito, 1991) and themes/words ratios (Zimmerman, 1987)

to Chi-squared comparison and t-tests (Adkins & Brashers, 1995; Feldman, 1987) to anova and repeated measures (Allen & Thompson, 1995; Eveland & Bikson, 1989) more involved quantitative methods such as factor analysis and multivariate and discriminant analysis (Huff, Sproull, & Kiesler, 1989; Komsky, 1991; Walther & Burgoon, 1992).

However, studies done within the field of education are usually descriptive of the email phenomenon happening in their own classrooms or prescriptive in nature in pointing out the steps to be taken in carrying out instruction with supplementation of email. Further efforts should be made to employ more standard either qualitative or quantitative procedures to study email either as a supplement or as a main channel of instruction delivery.

In general, the qualitative/quantitative studies reviewed here have employed various kinds of methods to explore email phenomenon. Yet, there are several points to be highlighted for caution. First, samplings are usually convenient ones, which limits the generalizability of any conclusions. Second, some studies have omitted reporting such crucial statistics as power and/or adjusted p values or r-squared. Omission of the statistic packages used in analyzing data is also a common flaw. Third, survey questionnaires as a tool should be further validated for others to be able to replicate studies. In a word, more rigorous research methods of both qualitative (such as ethnographic studies or constant comparison methods) and quantitative (such as factor analysis, discriminant analysis, and multiple regression) nature should be used in studying email communication in education.

Conclusions and suggestions for future research

1) A brief summary

Email is one of the networking capacities of computers. It has the capacity to bridge

the spatial and temporal differences. It could be asynchronous and synchronous, thus providing the flexibility of interaction or non-interaction. In reducing the social cues and enriching functions of easy editing, storing, and manipulating, email has lend itself to more user control and user responsibility.

These features of email have affected users in both positive and negative ways. It is capable of bringing traditionally peripheral persons into our instructional mainstream. The voices of these marginalized persons are heard via email communication in instructional settings. Their access to the traditional instructional resources such as teachers is realized through email. However, due to its reduced sense of social presence, email communication does have exhibited some sense of anonymity and depersonalization on the user part. Preferences of using email or not have been conjectured to be connected with the richness of the personalness embodied in email, with the tasks in hand, and with the user perceptions of email's utility.

Email has shown some unique discourse features of its own. It is direct, straight forward and more self-centered. The content of email messages could range from terse memo to lengthy romantic letters. The directionality of email messages appears to be bi-directional. It also allows the flow of messages to be horizontal and opens the possibility of peer collaboration.

While handing over more responsibilities to the user, email has offered some chances for users to develop positive attitudes and more positive work outcome. However it also touches off some undesirable behaviors on the part of the users such as flaming. What's more, the sporadic nature of email exchange has worried some researchers and may cause

confusion on the part of the reader.

Some researchers speculate that cognitively email might have impacts upon its users. However more systematic and empirical studies on this are still lacking. On the other hand, email is believed to have effects on social behaviors such as collaboration and on affects such as motivation. Yet, the anecdotal nature of these reports calls for further research for scientific verification.

2) future research

With the wide-spread availability and high frequency use of email at present, literacy researchers and educators could not but notice its existence more and more becoming a part of our daily life. However for literacy researchers and educators, the surface of this email iceburg has hardly been scratched yet. This metaphor could not be wrong given the wide-spread use of email today and possible universal use in the near future. It is no longer the question of willingness on the part of the educators to endorse its instructional applications. The question becomes how we as educators and literacy researchers can better understand email phenomenon in education and how we can capitalize on its instructional implications. Literacy and educational research has certainly noticed the urgency of the needed understanding about email and social dynamics it brings along and creates. Some work has been done in this regard as we have reviewed above. Yet, as we have pointed along the review that solid and systematic researches concerning email and literacy are still few and far between.

Considering the characteristics and impacts of email based upon the above review, the author here suggests the following possible research emphases in four areas concerning email

and literacy:

A. Cognitive implications of email-related literacy activities could be investigated. Both traditional text-driven approaches (such as discourse analysis or pragmatics) and more contemporary theories (such as social constructivism) can be adapted for studying cognitive implications. Specifically, the cognitive pattern change as suggested by Nilan (1993) could be studied; the possible cognitive demands imposed on the user by the disorderly nature of the arrays of email messages would also need to be confirmed or refuted; and the discourse forms or the genre perspective proposed by Yates and Orlikowski (1992) would also be a fruitful area to look into when considered in combination with the nature of literacy acquisition (such as the relationship of memory, tasks, knowledge, and meaning construction). What's more, language use and new conventions displayed by email messages can be studied into. The language functions of email would be extremely relevant when studied in light of the different purposes email has been put to: problem-solving vs. mere chatting, and as a chief means of instruction vs. as a supplement to traditional classroom teaching. Some work has been done investigating the cognitive effects of email on reader's retention of text ideas (Adrianson & Hjelmquist, 1993). However work on the effect of electronic mail on readers' processing of messages has hardly begun. Urgent work need to be done to examine readers' reading processes in reading email both in contrived lab situations and naturally-occurring contexts.

B. Social effects such as increased collaboration should be studied through both the qualitative and quantitative methods. This much commented collaboration has very pertinent implications for literacy instruction such as literacy as an act of involvement and social

interactions (Brandt, 1990). However, we need to understand two aspects of it before it would truly be capitalized upon for our instructional needs. First we need to make clear whether beneficial collaboration via email truly occur. Some empirical studies other than accounts of one's experience or one's perception of the outcome should be carried out to determine the quality of such collaboration. Secondly, we need to understand some accompanying phenomena coming along with collaboration (such as longer deliberation time for decision making), because we suspect in a less controlled situation such as email communication the accompanying phenomena sometimes might get an upper hand (as in the case of flaming) and thus be detrimental to the positive social interactions. Therefore a systematic understanding of the possible accompanying phenomena might provide us with some insight as to our own position in the literacy instruction picture involving email usage.

C. Affective anecdotes recorded concerning motivation will need systematic research to scientifically substantiate. Whether approached from the dichotomy of intrinsic and extrinsic motivations, or from systematic investigation of its displayed forms (such as equalization phenomenon believed to be effected by email), studies on motivational factors of email communication would benefit both our understanding of email phenomenon and its instructional applications. This is urgent considering the fact papers we have reviewed contain more enthusiastic descriptions of the impressions of the observers or participant-observers than data-base building efforts of researchers.

D. Different age groups and different language proficiency groups could be studied for their use of email in facilitating or non-facilitating or even deteriorating their language acquisition. For example, all the studies and reports reviewed in this paper have dealt with

subjects of fifth graders and above. This is understandable. As a mainly text-oriented means of communication, email requires basic reading and writing abilities as the pre-requisites. Students of fifth grade and above presumably possess these basic abilities. However, considering the motivational factors of email and children's natural tendency of looking for new things, it might be worthwhile to look into email feasibility with the emergent readers and writers of lower-than fifth grade. Collective composition of email messages with teacher's help, for instance, might be a possible area to investigate into.

The adult second language learners' use of email might be a very fruitful area to look into considering the function of email of bringing out the silent voices of those who are marginalized in the traditional classroom situations. The adult second language learners are comparatively silent in classroom situations due to their language limitations and cultural restraints. Email potential in promoting students' voice might be peculiar with second language learners. The process of looking for their own voice might also be a way of improving their literacy skills. The relationship of their language acquisition and the collaboration opportunities believed to be promised by email should also be systematically studied.

As this review suggests, some efforts have been made in assessing the email impacts in instructional settings. Yet, studies are needed for us to fully understand and capitalize on email as a vehicle for literacy instruction and acquisition.

Bibliography

Adkins, M. & Brashers, D.E. (1995). The power of language in computer-mediated groups. Management Communication Quarterly, 8, 289-322.

Adrianson, L., & Hjelmquist, E. (1993). Communication and memory of texts in face-to-face and computer-mediated communication. Computers in Human Behavior, 9, 121-135.

Ahern, T.C., Peck, K., & Laycock, M. (1992). The effects of teacher discourse in computer-mediated discussion. Journal of Educational Computing Research, 8, 291-309.

Allen, G. & Thompson, A. (1995). Analysis of the effect of networking on computer-assisted collaborative writing in a fifth grade classroom. Journal of Educational Computing Research, 12, 66-75.

Anderson, J. & Lee, A. (1995). Literacy teachers learning a new literacy: A study of the use of electronic mail in a reading education class. Reading Research and Instruction, 34, 222-238.

Angell, D. & Heslop, B. (1994). The Elements of E-mail Style: Communicate Effectively Via Electronic Mail. Reading, MA: Addison-Wesley Publishing Company.

Berge, Z.L. (1994). Electronic discussion groups. Communication Education, 43, 102-111.

Bikson, T.K., & Eveland, J.D. (1990). The interplay of work group structures and computer support. In J. Galengher, R.E. Kraut, & C. Egido (Eds.), Intellectual teamwork: Social and technological foundations of cooperative work (pp.245-290). Hillsdale, NJ: Lawrence Erlbaum.

Bolter, J.D. (1991). Writing Space: The Computer, Hypertext, and the History of Writing. Hillsdale, NJ: Lawrence Erlbaum Associates, Publishers.

Brandt, D. (1990). Literacy as Involvement: The Acts of Writers, Readers, and Texts. Carbondale: Southern Illinois University Press.

Coombs, N. (1993). Global empowerment of impaired learners: Data networks will transcend both physical distance and physical disabilities. Educational Media International, 30, 23-25.

Cross, T.B. & Raizman, M.B. (1986). Networking: An Electronic Mail Handbook. Glenview, Il: Scott, Foresman and Company.

Daft, R.L., & Lengel, R.H. (1986). Organizational information requirements, media richness and structural design. Management Science, 32, 554-571.

Daft, R.L., & Lengel, R.H., Trevino, L.K. (1987). Message equivocality, medial selection, and manager performance: Implications for information systems. MIS Quarterly, 355-366.

Dreher, H.V. (1984). Electronic mail: An exemplar of computer use in education. Educational Technology, August, 36-38.

D'Souza, P.V. (1991). The use of electronic mail as an instructional aid: An exploratory study. Journal of Computer-Based Instruction, 18, 106-110.

D'Souza, P.V. (1992). Electronic mail in academic settings: A multipurpose communications tool. Educational Technology, 32, 22-25.

Eveland, J.D. & Bikson, T.K. (1988). Work group structures and computer support: A field experiment. ACM Transactions on Office Information Systems, 6, 354-379.

Feldman, M.S. (1987). Electronic mail and weak ties in organizations. Office: Technology and People, 3, 83-101.

Fey, M.H. (1994). Finding voice through computer-communication: A new venue for collaboration. Journal of Advanced Composition, 14, 221-238.

Flores, M.J. (1990). Computer conferencing: Composing a feminist community of writers. In C. Handa (Ed.), Computers and Community: Teaching composition in the twenty-first century (pp.106-117). Portsmouth, NH: Heinemann.

Fulk, J., Steinfield, C.W., Schmitz., & Power, J. (1987). A social information processing model of media use in organizations. Communication Research, 14, 529-552.

Garton, L. & Wellman, B. (1995). Social impacts of electronic mail in organizations: A review of the research literature. In B.R. Burleson (Ed.), Communication Yearbook, 18, 434-453.

Golden, P. A., Beauclair, R., & Sussman, L. (1992). Factors affecting electronic mail use. Computers in Human Behavior, 8, 297-311.

Goode, J. & Johnson, M. (1991). Putting out the flames: The etiquette and law of e-mail. Online, 61-65.

Grohowski, R., McGoff, C., Vogel, D., Martz, B., & Munamaker, J.F. Jr. (1990). Implementing electronic meeting systems at IBM: Lessons learned and success factors. Management Information Systems Quarterly, December, 369-382.

Harris, J. (1994). Way of the ferret: Finding educational resources on the internet. Eugene, OR: International Society for Technology in Education.

Hawisher, G.E. & Moran, C. (1993). Electronic mail and the writing instructor.

College English, 55, 627-643.

Heath, S.B. (1991). The sense of being literate: Historical and cross-cultural features. In R. Barr, M.L. Kamil, P.B. Mosenthal, & P.D. Pearson (Eds.) Handbook of Reading Research, Vol II. (pp. 3-25). New York: Longman.

Hiltz, S.R. (1986). The "virtual classroom": Using computer-mediated communication for university teaching. Journal of Communication, 36, 95-104.

Holmes, M.E. (1995). Don't blink or you'll miss it: Issues in electronic mail research. Communication Yearbook 18, Thousand Oaks, CA: SAGE Publications.

Huff, C., Sproull, L., & Kiesler, S. (1989). Computer communication and organizational commitment: Tracing the relationship in a city government. Journal of Applied Social Psychology, 19, 1371-1391.

Kaye, A.R. (1992). Computer conferencing and mass distance education. In M.D. Waggoner (Ed.), Empowering Networks: Computer Conferencing in Education, Englewood Cliffs, New Jersey: Educational Technology Publications.

Kiesler, S., Siegel, J., & McGuire, T.W. (1984). Social psychological aspects of computer-mediated communication. American Psychologist, 39, 1123-1134.

Kinkead, J. (1987). Staffroom interchange. College Composition and Communication, 38, 337-341.

Komsky, S.H. (1991). A profile of users of electronic mail in a university: Frequent versus occasional users. Management Communication Quarterly, 4, 310-340.

Kuehn, S.A. (1994). Computer-mediated communication in instructional settings: A research agenda. Communication Education, 43, 171-183.

Lee, A.S. (1994). Electronic mail as a medium for rich communication: An empirical investigation using hermeneutic interpretation. MIS Quarterly, 143-57.

Liu, C., Peek, J., Jones, R., Buus, B., & Nye, A. (1994). Managing Internet Information. Sebastopol, CA: O'Reilly & Associates, Inc.

Lowry, M., Koneman, P., Osman-Jouchoux, R.,& Wilson, B. (1994). Electronic discussion groups: Using e-mail as an instructional strategy. Tech Trends, 39, 22-24.

Mabrito, M. (1991). Electronic mail as a vehicle for peer response. Written Communication, 8, 509-532.

Mackay, W.E. (1989). Diversity in the use of electronic mail: A preliminary inquiry. ACM Transactions on Office Information Systems, 6, 380-397.

Manes, S. (1988). The Complete MCI Mail Handbook. Toronto, Bantam Books, Inc.

McComb, M. (1994). Benefits of computer-mediated communication in college courses. Communication Education, 43, 157-170.

McCormick, N.B. & McCormick, J.W. (1992). Computer friends and foes: Content of undergraduates' electronic mail. Computers in Human Behavior, 8, 379-405.

Nilan, M.S. (1993). Speculations on the impact of global electronic networks on human cognition and human organization. Internet Research, 3, 47-56.

Nilles, J.M. (1983). Micros and Modems: Telecommunicating with personal computers. Reston, Virginia: Reston Publishing Company,Inc.

Olia, F.N. & Martin, D.S. (1994). Ethics and electronic mail: A study at Gallaudet University, March, 19-21.

Owen, T. (1990). Waiting to connect: The writer in electronic residence. The

Computing Teacher, Feb. 46-49.

Paramskas, D. (1993). Computer-assisted language learning (CALL): Increasingly integrated into an ever more electronic world. The Canadian Modern Language Review, 50, 124-133.

Parry, L.E. & Wharton, R.R. (1995). Electronic networking comes to the university: Factors that influence adoption among faculty. Journal of Research on Computing in Education, 27, 457-471.

Pearl, J.A. (1993). The e-mail quandary. Management Reviews, 82, 48-51.

Peters, P.E. (1994). Leadership strategies for networked enterprises: A personal perspective. Internet Research, 4, 23-29.

Pfaffenberger, B. (1993). Que's Computer User's Dictionary. Fourth Edition. Indianapolis, IN: Que Corporation.

Pierce, J., Glass, G., Young, M., & Soucy, D. (1994). The educational research list (ERL-L) on BITNET/INTERNET. Educational Researcher, 23, 25-28.

Reinking, D. (1994). Electronic literacy (Tech. Rep. No.4). Athens, GA: University of Georgia and University of Maryland, National Research Reading Center.

Rice, R.E. (1987). Computer-mediated communication and organizational innovation. Journal of Communication, 37, 65-94.

Rice, R.E. (1993). Media appropriateness: Using social presence theory to compare traditional and new organizational media. Human Communication Research, 19, 451-484.

Rice, R.E., Grant, A.E., Schmitz, J., & Torobin, J. (1990). Individual and network influences on the adoption and perceived outcomes of electronic messaging. Social Networks,

12, 27-55.

Robinson, M. (1994). Improving science teaching with e-mail. Computers in the Schools, 11, 95-107.

Robinson, P. (1992). Delivering Electronic Mail: Everything You Need to Know About E-Mail. M & T Publishing, Inc.

Romiszowski, A.J. & de Haas, J.A. (1989). Computer mediated communication for instruction: Using e-mail as a seminar. Educational Technology, 29, 7-14.

Schaefermeyer, M.J. & Sewell, Jr. E.H. (1988). Communicating by electronic mail. American Behavioral scientist, 32, 112-123.

Schmitz, J. & Fulk, J. (1991). Organizational colleagues, media richness, and electronic mail: A test of the social influence model of technology use. Communication Research, 18, 487-523.

Schwartz, J. (1990). Using an electronic network to play the scales of discourse. English Journal, 79, 16-24.

Seguin, A. & Seguin, C. (1995). Window to the world: Are you and your students ready to explore the internet? Vocational Education Journal, 70, 30-33.

Selfe, C.L. (1989). Redefining literacy: The multilayered grammars of computers. In G.E. Hawisher & C.L. Selfe (Eds.), Critical Perspectives on Computers and Composition Instruction (pp. 3-15). New York: Teachers College Press.

Selfe, C.L. (1990). Technology in the English classroom: Computer through the lens of feminist theory. In C. Handa (Ed.), Computers and Community: Teaching Composition in the Twenty-first Century, Portsmouth, NH: Heinemann.

Sherwood, K.D. (1994). A beginner's guide to effective email. on-line document.

Siegel, J., Dubrovsky, V., Kiesler, S., & McGuire, T.W. (1986). Group processes in computer-mediated communication. Organizational Behavior and Human Decision Processes, 37, 157-187.

Sirbu, M.A. (1981). A survey of electronic mail technology. Kahn, Vezza, & Roth (Eds). Electronic Mail and Message Systems: Technical and Policy Perspectives. Arlington, VA: American Federation of Information Processing Societies, Inc. 57-80.

Smith, W. E.(1994). Computer-mediated communication: An experimental study. Journalism Education, 48, 27-33.

Smolensky, M.W., Carmody, M.A., & Halcomb, C. G.(1990). The influence of task type, group structure and extroversion on inhibited speech in computer-mediated communication. Computers In Human Behavior, 6, 261-272.

Spitzer, M. (1989). Computer conferencing: An emerging technology. In G.E. Hawisher & C.L. Selfe (Eds.), Critical Perspectives on Computers and Composition Instruction (pp. 187-200). New York: Teachers College Press.

Sproull, L. & Kiesler, S. (1986). Reducing social context cues: Electronic mail in organization communication. Management Science 32, 1492-1512.

Sproull, L. & Kiesler, S. (1991). Connections: New Ways of Working in the Networked Organization. Cambridge: The MIT Press.

Steinfield, C. W. (1986). Computer-mediated communication in an organizational setting: Explaining task-related and socioemotional uses. In M. McLaughlin (Ed.), Communication Yearbook 9 (pp. 777-804). Beverly Hills, CA: Sage Publications.

Stirewalt, M.L., Jr. (1993). Studies in ancient Greek epistolography. Atlanta, GA: Scholars Press.

Sullivan, C.B. (1995). Preferences for electronic mail in organizational communication tasks. The Journal of Business Communication, 32, 49-64.

Thach, L. (1995). Using electronic mail to conduct survey research. Educational Technology, March/April, 27-31.

Townsend, C. (1984). Electronic Mail and Beyond: A User's Handbook of Personal Computer Communications. Belmont, CA: Wadsworth Electronic Publishing Company.

Traw, R. (1994). School/university collaboration via e-mail: A unique approach to teaching reading and language arts. Tech Trends, 39, 28-31.

Trevino, L.K., Daft, R.L., & Lengel, R.H. (1990). Understanding managers' media choices: A symbolic interactionist perspective. In J. Fulk & C. Steinfield (Eds.), Organizations and Communication Technology. Newbury Park, CA: SAGE Publications, Inc.

Trudell, L., Bruman, J., & Oliver, D. (1984). Options for Electronic Mail. White Plains, NY: Knowledge Industry Publications, Inc.

Vervest, P.H.M. (1987). Innovation in Electronic Mail: Towards Open Information Networks--Perspectives on Innovation Policy. Amsterdam: Elsevier Science Publishers B.V..

Vygotsky, L.S. (1978). Mind in Society. Cambridge, MA: Harvard University Press.

Walther, J.B. & Burgoon, J. (1992). Relational communication in computer-mediated interaction. Human Communication Research, 19, 50-88.

Webster, J., Trevino, L.K., & Ryan, L. (1993). The dimensionality and correlates of flow in human-computer interactions. Computers in Human Behavior, 9, 411-426.

Wild, R.H. & Winniford, M.A. (1993). Remote collaboration among students using electronic mail. Computers Education, 21, 193-203.

Wilkins, H. (1991). Computer talk: Long-distance conversations by computer. Writing Communication, 8, 56-78.

Yates, J., & Orlikowski, W.J. (1992). Genres of organizational communication: A structurational approach to studying communication and media. Academy of Management Review, 17, 299-326.

Zimmerman, D.P. (1987). Effects of computer conferencing on the language use of emotionally disturbed adolescents. Behavior Research Methods, Instruments, & Computers, 19, 224-230.